

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

REC'D 29 JUN 2005

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Applicant's or agent's file reference	FOR FURTHER ACTION		See Form PCT/IPEA/416																								
International application No. PCT/US04/09757	International filing date (day/month/year) 31 March 2004 (31.03.2004)	Priority date (day/month/year) 31 March 2003 (31.03.2003)																									
International Patent Classification (IPC) or national classification and IPC IPC(7): C10M 101/02 and US Cl.: 585/13; 252/387; 208/18, 19, 20, 21; 508/110																											
Applicant HAINES, THOMAS W																											
<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of <u>5</u> sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p style="margin-left: 20px;">a. <input checked="" type="checkbox"/> (sent to the applicant and to the International Bureau) a total of <u>9</u> sheets, as follows:</p> <div style="margin-left: 40px;"> <input type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions). <input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box. </div> <p style="margin-left: 20px;">b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) _____, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p> <p>4. This report contains indications relating to the following items:</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 10%;"><input checked="" type="checkbox"/></td> <td style="width: 20%;">Box No. I</td> <td>Basis of the report</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. II</td> <td>Priority</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. III</td> <td>Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. IV</td> <td>Lack of unity of invention</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>Box No. V</td> <td>Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. VI</td> <td>Certain documents cited</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>Box No. VII</td> <td>Certain defects in the international application</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>Box No. VIII</td> <td>Certain observations on the international application</td> </tr> </table>				<input checked="" type="checkbox"/>	Box No. I	Basis of the report	<input type="checkbox"/>	Box No. II	Priority	<input type="checkbox"/>	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability	<input type="checkbox"/>	Box No. IV	Lack of unity of invention	<input checked="" type="checkbox"/>	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement	<input type="checkbox"/>	Box No. VI	Certain documents cited	<input checked="" type="checkbox"/>	Box No. VII	Certain defects in the international application	<input checked="" type="checkbox"/>	Box No. VIII	Certain observations on the international application
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Date of submission of the demand 30 September 2004 (30.09.2004)		Date of completion of this report 14 January 2005 (14.01.2005)																									
Name and mailing address of the IPEA/ US Mail Stop PCT, Attn: IPEA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (703) 305-3230		Authorized officer Glenn Caldarola Telephone No. (571) 272-1700 <div style="text-align: right;"> Jean Proctor Paralegal Specialist </div>																									

Form PCT/IPEA/409 (cover sheet)(January 2004)

CORRECTED
VERSION

Box No. I Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ This report is based on translations from the original language into the following language _____, which is the language of a translation furnished for the purposes of:

- ☐ international search (under Rules 12.3 and 23.1(b))
☐ publication of the international application (under Rule 12.4)
☐ international preliminary examination (under Rules 55.2 and/or 55.3)

2. With regard to the elements of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

☐ the international application as originally filed/furnished

☒ the description:

pages NONE as originally filed/furnished

pages* 1-6 received by this Authority on 22 November 2004

pages* NONE received by this Authority on _____

☒ the claims:

pages NONE as originally filed/furnished

pages* NONE as amended (together with any statement) under Article 19

pages* 7-9 received by this Authority on 22 November 2004

pages* NONE received by this Authority on _____

☒ the drawings:

pages NONE as originally filed/furnished

pages* NONE received by this Authority on _____

pages* NONE received by this Authority on _____

☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing.

3. ☒ The amendments have resulted in the cancellation of:

- ☒ the description, pages NONE
☒ the claims, Nos. NONE
☒ the drawings, sheets/figs NONE
☒ the sequence listing (*specify*): NONE
☒ any table(s) related to the sequence listing (*specify*): NONE

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- ☐ the description, pages _____
☐ the claims, Nos. _____
☐ the drawings, sheets/figs _____
☐ the sequence listing (*specify*): _____
☐ any table(s) related to the sequence listing (*specify*): _____

** If item 4 applies, some or all of those sheets may be marked "superseded."*

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/US04/09757

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims <u>1-17</u>	YES
	Claims <u>NONE</u>	NO
Inventive Step (IS)	Claims <u>11-17</u>	YES
	Claims <u>1-10</u>	NO
Industrial Applicability (IA)	Claims <u>1-17</u>	YES
	Claims <u>NONE</u>	NO

2. Citations and Explanations (Rule 70.7)

Claims 1 and 5-7 lack an inventive step under PCT Article 33(3) as being obvious over Lin et al (5,498,353). Lin et al disclose a semi-synthetic two-stroke engine oil formulation which comprises a base oil consisting of a high-viscosity mineral oil in an amount of 0-20%, a medium-viscosity mineral oil in an amount of 10-50%, a solvent, and a mixture of other additives including three polyisobutylenes with different molecular weights, detergents and dispersants. The high-viscosity mineral oil is a paraffinic based oil having a viscosity of "about" 10-15 cSt at 100°C. The medium viscosity mineral oil is also a paraffinic based oil having a viscosity of "about" 4-8 cSt at 100°C. A suitable solvent is one which has a flash point of higher than 100°F, a boiling point of lower than 570°F and a distillation range from about 180° to 300°C. The claimed high viscosity petroleum hydrocarbon has a viscosity of greater than 16 cSt at 100° C; however, the mineral oil of the reference having a viscosity "about" 10-15 cSt at 100°C is seen to be within the claimed viscosity range. The open-ended claim language "comprising" allows for the addition of the other additives of the reference.

Claims 1-10 lack an inventive step under PCT Article 33(3) as being obvious over Kaneko et al (4,983,313). Kaneko et al disclose a refrigerating machine oil composition comprising (A) 85 to 30% by weight of alkyl benzene, (B) 5 to 70% by weight of a paraffin-based mineral oil having a kinematic viscosity at 40°C of 20-500 cSt, and (C) 1 to 30% by weight of a naphthene-based mineral oil having a kinematic viscosity at 40°C of 5 to 500 cSt. Kaneko et al meets the limitations of the above rejected claims since the viscosities of the claimed petroleum hydrocarbon oils of "greater than 6 cSt" and of "greater than 16 cSt" is met by the mineral oils of Kaneko et al. The alkyl benzene component of the reference is seen to be a solvent.

Claims 11-17 meet the criteria set out in PCT Article 33(2)-(3), because the prior art does not teach or fairly suggest the protective lubricant formulation comprising mineral spirits as the solvent, a first petroleum hydrocarbon, and a second petroleum hydrocarbon of specified viscosities.

Claims 1-17 meet the criteria set out in PCT Article 33(4), and thus the surface protective lubricant formulation has industrial applicability because the subject matter claimed can be made or used in industry.

NEW CITATIONS

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/US04/09757

Box No. VII Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

The description is objected to as containing the following defect(s) under PCT Rule 66.2(a)(iii) in the form or contents thereof: the left side margin is too small. In order to be fastened into the application file, holes are punched through the papers. In several instances, text is missing where the holes are located.

Claims 1-17 are also objected to under PCT Rule 66.2(a)(iii) as containing the following defect(s) in the form or contents thereof: the left side margin is too small. In order to be fastened into the application file, holes are punched through the papers. In several instances, text is missing where the holes are located. Additionally, in claim 11, the viscosity of the second petroleum hydrocarbon should be "greater than 16 centistokes" and not "greater than 6 centistokes" which makes the component identical to the first petroleum hydrocarbon component.

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/US04/09757

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

Claims 5, 6 and 7-10 are objected to under PCT Rule 66.2(a)(v) as lacking clarity under PCT Article 6 because these claims are indefinite for the following reason(s): The trademarks/tradenames "PROWAX 561" and "PROWAX 890" are included in these claims. The claim scope is uncertain since the trademark or trade name cannot be used properly to identify any particular material or product.

PROTECTIVE LUBRICANT FORMULATION

1 PEA/US

CROSS REFERENCES TO RELATED APPLICATIONS: U.S. Provisional Application for Patent 60/485,591, filed March 31, 2003, with title, "Protective Lubricant Formulation" which is hereby incorporated by referenced. Applicant claims priority pursuant to 35 U.S.C. par. 119(e)(i).

Statement as to rights to inventions made under federally sponsored research and development: Not applicable.

BACKGROUND OF THE INVENTION

1. Field of the Invention.

The present invention relates generally to protective lubricating compositions. More particularly, it relates to a corrosive inhibitor for protecting surfaces by applying a protective lubricant formulation comprising one hundred percent (100%) hydrocarbon components.

2. Brief Description of Prior Art.

A plurality of surface protective compositions are known in the art and available. Typically, these lubricants are applied to various surfaces through spraying, brushing or dipping and the lubricant then spreads or flows on the surface area. Such lubricants are applied to surfaces subject to the influence of corrosion. These coatings generally adhere to the permanent finish or metal surfaces which surfaces, when exposed to elements such as fresh or salt water, snow and the like, are susceptible to rapid corrosion. Presently such coating compositions may consist of a hydrocarbon component, but generally include various additives such as, water, esters, amides, glycols, phosphates, which forms the actual protective coatings.

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Consequently, there exists a need for a surface protectant composition that can be applied to a variety of surfaces yet easy to apply, is self-leveling over the surface and provides anti-corrosive capabilities. Applicants have discovered a new formulation comprising of one hundred percent (100%) hydrocarbon components that is useful as an anti-corrosive lubricant.

As will be seen from the subsequent description, the preferred embodiments of the present invention overcome shortcomings of the prior art.

SUMMARY OF THE INVENTION

Briefly stated, the present invention is directed to a quick-leveling liquid surface protectant composition together with a method of imparting a protective coating. The formulation is composed of one hundred percent (100%) hydrocarbon components. In particular, the composition consists of a synthetic iapparaffinic hydrocarbon (mineral spirits), and first and second petroleum hydrocarbons.

The protectant formulation can be applied to the surfaces of, for example, marine equipment, automotive, battery terminals, hand tools, farm equipment, recreational vehicles, heavy equipment, motorcycles, bicycles, shop machinery, power tools, household appliances, roller bearings, actuating cables, and hinges. The protective lubricant formulation of the present invention is easy to apply, is self-leveling over the surface, and provides anti-corrosive capabilities.

The formulation includes from about 20 to about 75 percent by weight of a synthetic iapparaffinic hydrocarbon; from about 1 to about 30 percent by weight of a first petroleum hydrocarbon; and, from about 1 to about 40 percent by weight of a second petroleum hydrocarbon. Said first petroleum hydrocarbon manufactured by ExxonMobil Corporation under the trade name PROWAX 561, and said second petroleum hydrocarbon manufactured by ExxonMobil Corporation under the trade name PROWAX 891. It is noted that, unless otherwise stated, all percentages given

in this specification and the appended claims refer to percentages by weight of total formulation.

The present formulation can be easily and evenly applied. Because this invention is particularly useful as a protective coating on a variety of surfaces, it will be described herein by reference to surfaces. Such description, however, is not intended to limit the scope of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

The present invention will be illustrated on the basis of the following description of the preferred embodiments thereof.

DESCRIPTION OF THE PREFERRED EMBODIMENT

In accordance with the present invention, a protective lubricant formulation is disclosed. More particularly, the formulation of the present invention is a surface protectant formulation that can be applied to a variety of surfaces yet easy to apply, is self-leveling over the surface and provides anti-corrosive capabilities.

Specifically, it will be noted in the following description that the present disclosure relates to an improved protective lubricant formulation having anti-corrosive properties. In the broadest context, the formulation consists of components configured with respect to each other so as to attain the desired objective.

In the preferred embodiment of the present invention, a protective lubricant formulation with enhanced anti-corrosion capabilities is provided comprising of one hundred percent (100%) hydrocarbon components. In particular, the composition includes a solvent hydrocarbon, and first and second petroleum hydrocarbons.

The hydrocarbon solvent, which is mineral spirits, constitutes a major amount of the protective lubricant formulation and is in the range of from about 20% to about 70%

by weight of the total composition. Most preferably, the hydrocarbon solvent is present in the range of from about 50% to about 60% by weight of the total composition, with about 55% being optimal. The term "mineral spirits" as it is used herein is preferably the chemical named synthetic iapparaffinic hydrocarbon having solvent-like properties to harmonize the action of the other ingredients contained in the lubricant formulation of the present invention as described hereinafter.

The first and second petroleum hydrocarbons are paraffin waxes and together constitute the balance of the protective lubricant formula. Paraffin waxes contain predominantly straight chain hydrocarbons with an average chain length of 20 – 30 carbon atoms. Paraffin waxes commonly contain a smaller portion of branched iso-paraffin hydrocarbons. The first and second paraffin waxes can be slack or scale waxes such as those commonly derived through petroleum distillation. In particular, the first petroleum hydrocarbon is in the range of from about 1% to about 35% by weight of the total formulation. Most preferably, the first petroleum hydrocarbon is present in the range of from about 13% to about 23% by weight of the total formulation, with about 18% being optimal.

The physical properties of the first hydrocarbon can be can be generally defined as:
Paraffin wax

SOLUBILITY IN WATER: Negligible

VISCOSITY AT 40 C, cSt: >70.0

VISCOSITY AT 100 C, cSt: > 6.8

Oil content: 20%

Congealing point in the range of 55 – 70 °C.

The first petroleum hydrocarbon has a lower viscosity than the second hydrocarbon, this gives the total formulation greater penetration so that the total formulation is better able to penetrate through rust, dirt and seams and provides greater protection against oxidation than would be possible with the second hydrocarbon alone. As such, the formulation can be used to prevent metallic oxidation or to penetrate and allow rusted parts, such as bolts, to be loosened.

ID 5A/US

In accordance with the preferred embodiment, the first petroleum hydrocarbon can be a paraffin such as PROWAX 561 manufactured by ExxonMobil Corporation.

The second petroleum hydrocarbon is in the range of from about 1% to about 40% by weight of the total formulation. Most preferably, the second petroleum hydrocarbon is present in the range of from about 21% to about 31% by weight of the total formulation, with about 26% being optimal.

The physical properties of the second petroleum hydrocarbon can be generally defined as:

Paraffin wax

SOLUBILITY IN WATER: Negligible

VISCOSITY AT 40 C, cSt: > Not Applicable

VISCOSITY AT 100 C, cSt: > 16.0

Congealing point in the range of 40 - 55 °C.

The second petroleum hydrocarbon has a higher viscosity than the first hydrocarbon, this gives the total formulation greater body so that the total formulation has a longer useful life and provides greater protection than would be possible with the first hydrocarbon alone. As such the formulation, when placed on a surface, forms a seal that protects against moisture, rust and corrosion. The formulation includes paraffins that are not significantly water soluble and thus the formulation will not easily wash off with water. The formulation can however be removed with organic solvents. Because it contains heavy bodied paraffins, the formulation can be sprayed on surfaces such as chains, gears and mechanisms and the formulation will not drip off like oil. The formulation instead forms a gel-like mass a portion of which will stay put on a surface even after some of the lighter components of the formulation have penetrated the surface.

In accordance with the preferred embodiment, the second petroleum hydrocarbon can be a paraffin such as PROWAX 890 manufactured by ExxonMobil Corporation.

The formulation can be prepared by thoroughly mixing with slight agitation each of the components. Preferably, the formulation is prepared by the following steps: charge the desired amount of the solvent hydrocarbon to a mix vessel, add the first petroleum hydrocarbon to the mix vessel with slight agitation, then add the second petroleum hydrocarbon to the mix vessel with slight agitation and continue to agitate at ambient temperature until all the ingredients are thoroughly mixed. In the more preferred embodiment, the formulation is mixed using about 55% mineral spirits, about 18% of the first petroleum hydrocarbon, and about 26% of the second petroleum hydrocarbon. In this embodiment, the formulation can be applied to the surface to be protected by the use of an aerosol, preferably a non-polar aerosol, or by a pump spray. Of course, other means of applying the formulation are contemplated, such as by wetting a sponge, brush, cloth or the like, with the formulation and then applying the sponge, brush or cloth directly to the surface to be protected, or when applicable, by submerging the object to be protected directly into the formulation. When not applying the formulation with a spray or aerosol as discussed above, the ratio of the formulation may be varied consistent with the acceptable range disclosed herein.

Although the description above contains many specificities, these should not be construed as limiting the scope of the invention but as merely providing illustrations of some of the presently preferred embodiments of this invention. It is understood the components of the protective lubricant described and characterized here are not exclusive of other equivalent components which are within the scope of the appended claims. It should be understood by one skilled in possession of this disclosure having studied the same that he can determine by mere routine tests components equivalent to the solvent hydrocarbon component and the first and second petroleum hydrocarbon components of the invention for admixture therewith.

Thus the scope of the invention should be determined by the appended claims in the formal application and their legal equivalents, rather than by the examples given.

Claims

I claim:

1. A surface protective lubricant formulation having anti-corrosive capabilities, said lubricant formulation comprising:
 - a solvent hydrocarbon, and
 - a first petroleum hydrocarbon, and
 - a second petroleum hydrocarbon,wherein the hydrocarbon solvent is in the range of from about 20% to about 70% by weight of the total formulation,
 - wherein the first petroleum hydrocarbon is a paraffin having a viscosity at 100 °C greater than 6 centistokes and is in the range of from about 1% to about 35% by weight of total formulation, and
 - wherein the second petroleum hydrocarbon is a paraffin having a viscosity at about 100 °C greater than 16 centistokes and is in the range of from about 1% to about 40% by weight of the total formulation.
2. The protective lubricant formulation as recited in Claim 1, wherein the hydrocarbon solvent is about 55% by weight of the total formulation.
3. The protective lubricant formulation as recited in Claim 2, wherein the first petroleum hydrocarbon is about 18% by weight of the total formulation.
4. The protective lubricant formulation as recited in Claim 3, wherein the second petroleum hydrocarbon is about 26% by weight of the total formulation.
5. The protective lubricant formulation as recited in Claim 1, wherein the first petroleum hydrocarbon is manufactured by ExxonMobil Corporation under the trade name PROWAX 561.

6. The protective lubricant formulation as recited in Claim 1, wherein the second petroleum hydrocarbon is manufactured by ExxonMobil Corporation under the trade name PROWAX 890.
7. A method of preparing a surface protective lubricant formulation having anti-corrosive capabilities comprising:
- adding a solvent hydrocarbon to a mix vessel,
 - adding a first petroleum hydrocarbon to the mix vessel with slight agitation,
 - adding a second petroleum hydrocarbon to the mix vessel with slight agitation,
 - agitating until all the ingredients are thoroughly mixed,
 - wherein the hydrocarbon solvent is in the range of from about 20% to about 70% by weight of the total formulation,
 - wherein the first petroleum hydrocarbon is in the range of from about 1% to about 35% by weight of the total formulation,
 - wherein the second petroleum hydrocarbon is in the range of from about 1% to about 40% by weight of the total formulation,
 - wherein the first petroleum hydrocarbon is manufactured by ExxonMobil Corporation under the trade name PROWAX 561, and
 - wherein the second petroleum hydrocarbon is manufactured by ExxonMobil Corporation under the trade name PROWAX 890.
8. The method as recited in Claim 7, wherein the hydrocarbon solvent is about 55% by weight of the total formulation.
9. The method as recited in Claim 8, wherein the first petroleum hydrocarbon is about 18% by weight of the total formulation.
10. The method as recited in Claim 9, wherein the second petroleum hydrocarbon is about 26% by weight of the total formulation.

11. A protective lubricant formulation having anti-corrosive capabilities, said lubricant formulation comprising;
- a mineral spirits solvent, and
 - a first petroleum hydrocarbon, and
 - a second petroleum hydrocarbon,
- wherein the mineral spirits solvent is in the range of from about 20% to about 70% by weight of the total formulation,
- wherein the first petroleum hydrocarbon is a paraffin having a viscosity at 100 °C greater than 6 centistokes and is in the range of from about 13% to about 23% by weight of total formulation, and
- wherein the second petroleum hydrocarbon is a paraffin having a viscosity at 100°C greater than 6 centistokes and is in the range of from about 21% to about 31% by weight of total formulation.
12. The protective lubricant formulation as recited in Claim 11, further wherein the formulation is placed under pressure for aerosol application.
13. The protective lubricant formulation as recited in Claim 11, further wherein said first and second petroleum hydrocarbons contain straight chain and branched hydrocarbons.
14. The protective lubricant formulation as recited in Claim 11, further wherein said first petroleum hydrocarbon has a congealing point below 70°C.
15. The protective lubricant formulation as recited in Claim 14, further wherein said second petroleum hydrocarbon has congealing point below 55°C.
16. The protective lubricant formulation as recited in Claim 11, further wherein said first petroleum lubricant has a congealing point in the range of 55-70°C.
17. The protective lubricant formulation as recited in Claim 11, further wherein said second petroleum lubricant has a congealing point in the range of 45-55°C.